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Mary E. Orse

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This study evaluates alternative procedures which use Item Mission Essentiality Codes (IMECs) in computing Fleet Issue Load List (FILL) depth. These procedures include separate effectiveness goals by IMEC, weights by IMEC in the risk equation, and minimum protection levels by IMEC. The alternative procedures are evluated in terms of effectiveness and cost. Some alternatives increase the effectiveness for IMEC 4 items by up to 12-15 percentage points without requiring additional funding. We recommend using separate effectivenss goals by IMEC and applying higher minimum protection levels for IMECs 3 and 4 and lower minimum protection levels for IMECs 1 and 2 in the FILL depth computations.

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IMEC IMPLEMENTATION FOR FILL DEPTH COMPUTATIONS

OPERATIONS ANALYSIS DEPARTMENT

NAVY FLEET MATERIAL SUPPORT OFFICE (FMSO)

Mechanicsburg, Pennsylvania 17055

Report 168

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FILL DEPTH COMPUTATIONS

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REPORT 168

Submitted by: M. E. Orse

M. E. ORSE
Operations Research Analyst

Approved by:

D. B. WADSWORTH, CDR, SC, USN
Director, Operations Analysis
Department

H. M. HARMS, CAPT, SC, USN
Commanding Officer
Navy Fleet Material Support Office

DATE: SEP 29 1987

ABSTRACT

This study evaluates alternative procedures which use Item Mission Essentiality Codes (IMECs) in computing Fleet Issue Load List (FILL) depth. These procedures include separate effectiveness goals by IMEC, weights by IMEC in the risk equation, and minimum protection levels by IMEC. The alternative procedures are evaluated in terms of effectiveness and cost. Some alternatives increase the effectiveness for IMEC 4 items by up to 12-15 percentage points without requiring additional funding. We recommend using separate effectiveness goals by IMEC and applying higher minimum protection levels for IMECs 3 and 4 and lower minimum protection levels for IMECs 1 and 2 in the FILL depth computations.

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EXECUTIVE SUMMARY

1. Background. Fleet Issue Load Lists (FILLs) are carried by AFSs whose primary mission is to provide resupply support to other ships. FILL costs and AFS space constraints limit the range and depth of items an AFS can carry; not every item which might be needed by one of the supported ships is carried. Every effort is made to insure that the AFS can provide the items most essential to the supported ships. Current programs and procedures do no identify the most essential load list candidate items. Almost every item is coded "vital" to the ship's mission, thus making it impossible to distinguish between the most essential items and the other less important candidates. Recently a new measure of essentiality, the Item Mission Essentiality Code (IMEC), has been introduced which more accurately differentiates essentiality between items.

2. Objective. To develop and evaluate alternative procedures which use IMECs in computing FILL depth.

3. Approach. Test load lists were built using candidate files from the Pacific and Atlantic Fleets in order to evaluate various techniques of incorporating IMECs in the FILL depth computation. The alternatives considered separate effectiveness goals by IMEC, weighting the risk equation by IMEC, and applying minimum protection levels by IMEC. The test load lists were evaluated in terms of dollar value and actual effectiveness where actual effectiveness is defined as how well a load list compares with 90 days of Mobile Logistics Support Force (MLSF) demand data. Alternatives with the largest increase in effectiveness for IMECs 3 and 4 and the smallest change in effectiveness for IMECs 1 and 2 and in total investment costs were considered to give the "best performance".

4. Findings. All alternative techniques for using IMECs reduced or maintained dollar investment and increased effectiveness for IMECs 3 and 4 up to 11 percentage points above current FILL effectiveness. Combining the "best performance" from each alternative technique increased effectiveness for IMEC 4 significantly, up to 12-15 percentage points, while keeping investment cost near current spending levels. Comparing the combination of goals and minimum protection levels by IMEC with the combination of IMEC weights in the risk equation and minimum protection levels by IMEC, the goals by IMEC produced smaller increases in IMEC 3 effectiveness, but also produced smaller decreases in IMEC 1 requisition effectiveness. Although neither alternative is clearly best, the alternative using effectiveness goals by IMEC allows the user more easily to improve the performance of any given IMEC. Also, assigning weights by IMEC in the risk equation is purely subjective; i.e., the relative importance of one IMEC to another. Therefore, the combination of effectiveness goals by IMEC and lower minimum protection levels for IMECs 1 and 2 and higher protection levels for IMECs 3 and 4 is considered to be the "best".

5. Recommendation. We recommend using separate effectiveness goals by IMEC and applying higher minimum protection levels for IMECs 3 and 4 and lower minimum protection levels for IMECs 1 and 2 in the FILL depth computations.

I. INTRODUCTION

An AFS's primary mission is to provide resupply support to other ships. In order to accomplish this mission an AFS carries a Fleet Issue Load List (FILL). FILL costs, AFS space constraints, and other factors limit the range and depth of items an AFS can carry. Hence, an AFS cannot include every item which might be needed by one of the ships it supports. Because of these limitations, every effort is made to insure that the items on the FILL are the ones most essential to the supported ships. Current programs and procedures do not identify the most essential load list candidate items. Almost every item is coded "vital" to the ship's mission, thus making it impossible to distinguish between the most essential items and the other less important candidates.

Recently, Item Mission Essentiality Codes (IMECs) were introduced as more accurately differentiating essentiality between items. TABLE I shows the definitions for each IMEC value.

TABLE I

IMEC DEFINITIONS

IMEC	DEFINITIONS
1	Lack of item causes minor mission impact
2	Lack of item results in loss of secondary mission capability
3	Lack of item results in severe degradation of primary mission capability
4	Lack of item causes total loss of primary mission capability
5	Item related to life support or personnel safety

IMECs are based on an item's Military Essentiality Code (MEC) and Mission Criticality Code (MCC). MECs define the importance of a part to the equipment in which it is installed and are assigned values of 1 (vital), 3 (nonvital), 5 (safety) or 7 (partial). Although MEC 7 was recently approved, they do not yet exist in the data base and IMEC programs do not yet recognize them. MCCs are based on historical Casualty Reporting (CASREP) data and reflect an equipment's essentiality to the ship's mission. MCCs are assigned values from 1 to 4. TABLE II shows the IMEC derivation.

TABLE II

IMEC DERIVATION

MEC	MCC	IMEC
1	1	1
1	2	2
1	3	3
1	4	4
1	other	1
3	all values	1
5	all values	5

Reference 1 of APPENDIX A tasked the Navy Fleet Material Support Office (FMSO) to evaluate various techniques to incorporate IMECs in the FILL depth computation. Reference (2) of APPENDIX A documents a study to incorporate IMECs in the FILL range computations.

II. TECHNICAL APPROACH

A. DATA. Test load lists for the Pacific and Atlantic Fleets were built using

a candidate file for each Fleet. Each candidate file included: (1) demand from March 1983 through February 1985 for all ships that are supported by an AFS and (2) the wholesale IMEC (the highest IMEC across all applications). The resulting FILLs were then evaluated by matching the load lists against Mobile Logistic Support Force (MLSF) demand data for a subsequent 90 day period, March 1985 through May 1985. Except for a few overrides, the Pacific and Atlantic FILLs contain the same range of items; however, their depth may differ based on each Fleet's demand history. In a production mode, the range differences would be resolved during the manual reviews.

B. ALTERNATIVES. Alternative FILLs were built using various techniques to incorporate IMECs in the FILL depth computations. IMECs were tested in the following areas: separate effectiveness goals by IMEC, weighting the risk equation by IMEC and applying protection levels by IMEC. Each of these alternative FILLs were evaluated in terms of effectiveness and dollar investment and compared to a "benchmark" FILL (a load list built using current procedures).

TABLEs III and IV show the Pacific and Atlantic benchmarks, respectively. Items assigned an IMEC 4 or 5 were grouped together and treated as IMEC 4. Items with no IMEC were treated as IMEC 1 in this report. The range and effectiveness statistics for Depot Level Repairable (DLR), Equipment Related (ER) and Non-Equipment Related (NER) items are shown in TABLEs III and IV for information purposes only. These and other statistics shown in this report for DLR, ER and NER items are not considered as important as the IMEC category statistics.

TABLE III

PACIFIC FILL BENCHMARK*

	RANGE		ACTUAL NET EFFECTIVENESS	
			UNIT	REQUISITION
Total Pacific FILL	DLR	830	69.2%	69.6%
	ER	12,531	61.1%	62.8%
	NER	3,884	66.6%	78.6%
	TOTAL	17,245	65.0%	71.1%
IMEC 1	DLR	50	72.5%	72.4%
	ER	2,291	45.8%	54.9%
	NER	2,680	65.8%	78.9%
	TOTAL	5,021	63.7%	75.3%
IMEC 2	DLR	67	74.1%	74.3%
	ER	608	66.9%	62.5%
	NER	157	84.9%	81.6%
	TOTAL	832	78.5%	73.7%
IMEC 3	DLR	383	70.6%	70.9%
	ER	3,193	62.5%	62.6%
	NER	342	72.7%	77.1%
	TOTAL	3,918	68.9%	67.5%
IMEC 4	DLR	330	64.8%	65.8%
	ER	6,439	64.2%	64.5%
	NER	705	62.4%	77.8%
	TOTAL	7,474	63.2%	68.0%

*Based on 85% predicted unit effectiveness goal for each of the following categories: DLR, ER, and NER.

TABLE IV

ATLANTIC FILL BENCHMARK*

	RANGE		ACTUAL NET EFFECTIVENESS UNIT	ACTUAL NET EFFECTIVENESS REQUISITION
Total Atlantic FILL	DLR	830	65.4%	65.9%
	ER	12,523	65.4%	64.1%
	NER	3,852	64.7%	64.3%
	TOTAL	17,205	65.0%	64.3%
IMEC 1	DLR	50	82.7%	66.6%
	ER	2,287	59.9%	62.5%
	NER	2,649	59.6%	63.4%
	TOTAL	4,986	59.7%	63.3%
IMEC 2	DLR	67	63.0%	64.5%
	ER	607	69.0%	63.4%
	NER	156	85.6%	72.0%
	TOTAL	830	81.4%	68.2%
IMEC 3	DLR	383	68.1%	67.8%
	ER	3,192	57.6%	64.1%
	NER	342	70.8%	65.7%
	TOTAL	3,917	66.0%	65.0%
IMEC 4	DLR	330	58.2%	60.7%
	ER	6,437	67.0%	66.4%
	NER	705	65.8%	67.5%
	TOTAL	7,472	66.3%	66.6%

*Based on 85% predicted unit effectiveness goal for each of the following categories: DLR, ER, and NER.

As shown in TABLEs III and IV, over 65% of the items on a FILL are IMEC 3 or 4. This distribution occurs only due to the items' demand characteristics, since FILLs are not managed by IMECs today. Actual effectiveness measures how well a load list compares with 90 days of actual demand. The following equations were used to compute effectiveness.

$$\text{ACTUAL NET UNIT EFFECTIVENESS} = \frac{\text{\# OF UNITS SATISFIED}}{\text{\# OF UNITS DEMANDED FOR LOAD LIST ITEMS}}$$

$$\text{ACTUAL NET REQUISITION EFFECTIVENESS} = \frac{\text{\# OF REQUISITIONS SATISFIED}}{\text{\# OF REQUISITIONS DEMANDED FOR LOAD LIST ITEMS}}$$

Effectiveness, as defined above, and dollar investment, helped to determine which alternatives gave the "best" results. For purposes of this study, alternatives considered to give the "best performance" were ones which produced the highest effectiveness for IMECs 3 and 4, while minimizing the impact on IMECs 1 and 2 effectiveness and maintaining the current spending level. Because of the small number of IMEC 2s in both Fleets, large increases or decreases in net effectiveness for those items were not considered significant. The following sections describe each of the IMEC alternatives evaluated.

1. Effectiveness Goals By IMEC. Currently, the FILL is based on separate 85% predicted unit effectiveness goals for each of the following categories: DLR, ER, and NER. Using separate effectiveness goals for each IMEC, alternative FILLs were constructed and evaluated. Dollar value versus effectiveness curves were constructed as shown in APPENDIX B. The most cost effective goals were estimated as: 85% for IMEC 1, 95% for IMEC 2, 92% for IMEC 3 and 90% for IMEC 4. Cost effective is defined as the point at which the highest effectiveness can be achieved for the least cost; i.e., graphically, the point where the curve starts

to level off. These goals were evaluated as shown in Alternative III in TABLE V. However, it is unlikely that we would assign IMEC 2s a higher performance goal than IMEC 3s and 4s. Other goals also considered are shown in TABLE V. These goals were chosen on the assumption that IMEC 1 and 2 items should not get less support than current policy (85% effectiveness) and that IMEC 3 and 4 items should receive at least as much support as the IMEC 1 and 2 items.

The advantage to using separate effectiveness goals by IMEC is that it allows us to compare the actual performance of each IMEC to its goal. The disadvantage to this method is that instead of adjusting three parameters to achieve effectiveness goals for DLR, ER, and NER items, there are now four parameters, one for each IMEC. However, if IMECs are grouped together (i.e., IMECs 1 and 2 and IMECs 3 and 4), then the number of required parameters is reduced.

TABLE V

PREDICTED UNIT EFFECTIVENESS GOALS BY IMEC

	ALTERNATIVES			
	I	II	III	IV
IMEC 1	85%	85%	85%	85%
2	90%	90%	95%	90%
3	92%	92%	92%	90%
4	95%	92%	90%	90%

2. Weights By IMEC. Using weights in the risk equation is another technique for incorporating IMECs in the depth computations. The current risk equation is

computed as follows:

$$\text{RISK} = \frac{(\lambda)(\text{UNIT PRICE})}{\text{AVERAGE QUARTERLY DEMAND}}$$

where

λ or lambda is a parameter which controls the risk of stockout

Risk of stockout controls the depth of an item. Thus, by varying the lambda value, effectiveness and dollar value of a FILL will change; i.e., decreasing the lambda value will lower the risk of stockout and increase effectiveness and dollar value and, vice versa, increasing the lambda value will decrease effectiveness and cost. We weighted the risk equation, as follows:

$$\text{RISK} = \frac{(\lambda)(\text{UNIT PRICE})}{(\text{AVERAGE QUARTERLY DEMAND})(E)}$$

where

E = essentiality weight

The risk of stockout will also vary according to the essentiality of an item or group of items. The higher the essentiality of an item, the lower the risk of stockout, thus higher effectiveness for essential items.

By definition, IMECs 3 and 4 are considered more important than IMECs 1 and 2; thus, IMECs 3 and 4 should have a higher essentiality weight. TABLE VI shows the weights by IMEC that were used to build alternative FILLs.

TABLE VI

WEIGHTS BY IMEC

	ALTERNATIVES			
	I	II	III	IV
IMEC 1	1	.01	1	1
2	2	.1	4	1
3	3	.5	9	99
4	4	1.0	16	99

Graphing the dollar value versus the associated predicted effectiveness for each of the alternatives shown above, showed the cost effective goal to be about 88% for all items. The graphs are shown in APPENDIX C.

Using weights in the risk equation has advantages and disadvantages. Weights in the risk equation allow items of greater importance (criticality) to have a larger depth than normally would have been computed. The disadvantage is in the establishment of relative importance of IMECs to each other; i.e., are IMEC 4's 100 times more important than IMEC 1's or four times more important? A second drawback is that when tracking performance by IMEC and using this method, it is difficult to try to improve the performance of only one group if only one group was performing poorly.

3. Protection Levels By IMEC. Another technique for incorporating IMECs in the depth computations is varying minimum protection levels by IMEC. Protection levels are defined as the probability of having that item when needed. Conceptually, protection level is the complement of risk (risk of stockout); i.e., if protection level is 60%, then the risk of stockout is 40%, or if protection

level is 85%, then the risk of stockout is 15%. Therefore, raising the minimum protection level, lowers the risk of stockout and increases effectiveness and vice versa, lowering the protection level decreases effectiveness. Using the definition of IMEC and the relationship between protection levels and risk, increasing the minimum protection levels for IMECs 3 and 4 from the current 60% increases the depth for those IMECs, thereby increasing effectiveness for IMECs 3 and 4. Conversely, lowering the minimum protection level for IMECs 1 and 2 means a lower effectiveness.

Alternative FILLs were built using varied minimum protection levels for IMECs 1 and 2 and IMECs 3 and 4. TABLE VII shows the protection level constraints used in the alternatives.

As with using weights in the risk equation, varying minimum protection levels depends on the importance of the item. Increasing the minimum protection levels allows some items to have larger than normally computed depths. The problems with this method are similar to the weighting method.

TABLE VII

MINIMUM-MAXIMUM PROTECTION LEVELS BY IMEC

	ALTERNATIVES			
	I	II	III	IV
IMECs 1 and 2	60% - 98%	60% - 98%	2% - 98%	2% - 98%
IMECs 3 and 4	85% - 98%	75% - 98%	85% - 98%	75% - 98%

III. FINDINGS

The following sections describe the findings of the alternative FILLS. IMECs were used in the following areas: effectiveness goals by IMEC, weights by IMEC, protection levels by IMEC, and combinations of these alternatives.

A. EFFECTIVENESS GOALS BY IMEC. TABLEs VIII and IX show four alternative FILLS with different effectiveness goals by IMEC. Alternative I uses effectiveness goals that are similar to the wholesale goals for each IMEC, (i.e., 85% for IMEC 1, 90% for IMEC 2, 92% for IMEC 3, and 95% for IMEC 4). Alternative III uses the goals that are the most cost effective for each IMEC. The goals used in Alternatives II and IV were chosen to follow the logic that the least important items (IMEC 1) should have a goal equal to today's overall goal and each group of more important items should have a goal equal to or higher than the preceding group. As shown in TABLEs VIII and IX, all of the alternatives reduced investment costs by $.1M to $3.1M except for Alternatives I and II in the Atlantic, which increased investment $2.6M and $.6M, respectively. The tables also show that effectiveness for IMEC 3 and 4 generally increased. IMEC 3 differed from -4 to +5 percentage points from the benchmark and IMEC 4 ranged from four to 16 percentage points above the benchmark.

Alternatives I, II, and III provide similar results for the Pacific. Although IMEC 2 effectiveness is higher in Alternative III, it is not significant because of the small number of items assigned IMEC 2. For the Atlantic, Alternative II provides the best IMEC 4 support at close to current cost. Therefore, Alternative II is the "best" between the two Fleets.

TABLE VIII

GOALS BY IMEC (PACIFIC)

(17,245 ITEMS)

ALTERNATIVE	$ VALUE	ACTUAL NET EFFECTIVENESS					
			UNIT	REQN		UNIT	REQN
BENCHMARK*	68.7M	DLR	69.2%	69.6%	IMEC 1	63.7%	75.3%
		ER	61.1%	62.8%	IMEC 2	78.5%	73.7%
		NER	66.6%	78.6%	IMEC 3	68.9%	67.5%
		TOTAL	65.0%	71.1%	IMEC 4	63.2%	68.0%
PREDICTED GOALS BY IMEC							
ALTERNATIVE I							
IMEC GOAL	65.9M						
1 85%		DLR	65.3%	66.0%	IMEC 1	62.6%	67.7%
2 90%		ER	77.1%	74.0%	IMEC 2	69.8%	64.5%
3 92%		NER	64.4%	71.1%	IMEC 3	73.6%	68.4%
4 95% **		TOTAL	68.0%	72.3%	IMEC 4	71.3%	79.4%
ALTERNATIVE II							
IMEC GOAL	65.9M						
1 85%		DLR	65.3%	66.0%	IMEC 1	62.6%	67.7%
2 90%		ER	77.1%	74.0%	IMEC 2	69.8%	64.5%
3 92%		NER	64.4%	71.1%	IMEC 3	73.6%	68.4%
4 92% **		TOTAL	68.0%	72.3%	IMEC 4	71.3%	79.4%
ALTERNATIVE III							
IMEC GOAL	65.9M						
1 85%		DLR	65.3%	66.0%	IMEC 1	62.6%	67.7%
2 95%		ER	77.3%	74.1%	IMEC 2	81.0%	80.1%
3 92%		NER	64.8%	71.2%	IMEC 3	73.6%	68.4%
4 90% **		TOTAL	68.4%	72.4%	IMEC 4	71.3%	79.4%
ALTERNATIVE IV							
IMEC GOAL	65.6M						
1 85%		DLR	65.3%	66.0%	IMEC 1	62.6%	67.7%
2 90%		ER	75.8%	73.2%	IMEC 2	69.8%	64.5%
3 90%		NER	63.9%	70.2%	IMEC 3	69.1%	63.3%
4 90% **		TOTAL	67.3%	71.5%	IMEC 4	71.3%	79.4%

*Based on 85% predicted unit effectiveness goal for each of the following categories: DLR, ER, and NER.

**The highest predicted effectiveness we could reach was 88.2%.

TABLE IX

GOALS BY IMEC (ATLANTIC)

(17,205 ITEMS)

ALTERNATIVE	$ VALUE	ACTUAL NET EFFECTIVENESS					
			UNIT	REQN		UNIT	REQN
BENCHMARK*	60.0M	DLR	65.9%	65.4%	IMEC 1	59.7%	63.3%
		ER	64.1%	65.4%	IMEC 2	81.4%	68.2%
		NER	64.3%	64.7%	IMEC 3	66.0%	65.0%
		TOTAL	64.3%	65.0%	IMEC 4	66.3%	66.6%
PREDICTED GOALS BY IMEC							
ALTERNATIVE I	62.6M						
IMEC GOAL							
1 85%		DLR	63.0%	62.5%	IMEC 1	65.2%	65.9%
2 90%		ER	80.8%	76.8%	IMEC 2	74.0%	67.4%
3 92%		NER	67.8%	69.6%	IMEC 3	70.7%	65.9%
4 95% **		TOTAL	71.6%	72.6%	IMEC 4	78.2%	83.1%
ALTERNATIVE II	60.6M						
IMEC GOAL							
1 85%		DLR	62.9%	62.3%	IMEC 1	65.2%	65.9%
2 90%		ER	79.6%	73.0%	IMEC 2	74.0%	67.4%
3 92%		NER	67.8%	68.9%	IMEC 3	70.7%	65.9%
4 92%		TOTAL	71.2%	70.5%	IMEC 4	77.1%	77.7%
ALTERNATIVE III	59.9M						
IMEC GOAL							
1 85%		DLR	62.9%	62.5%	IMEC 1	65.2%	65.9%
2 95%		ER	76.3%	68.6%	IMEC 2	84.2%	68.8%
3 92%		NER	67.6%	67.3%	IMEC 3	70.7%	65.9%
4 90%		TOTAL	70.1%	67.8%	IMEC 4	73.4%	70.3%
ALTERNATIVE IV	59.8M						
IMEC GOAL							
1 85%		DLR	62.9%	62.5%	IMEC 1	65.2%	65.9%
2 90%		ER	74.8%	68.3%	IMEC 2	74.0%	67.4%
3 90%		NER	66.5%	66.9%	IMEC 3	66.1%	64.3%
4 90%		TOTAL	69.0%	67.4%	IMEC 4	73.4%	70.3%

*Based on 85% predicted unit effectiveness goal for each of the following categories: DLR, ER, and NER.

** The highest predicted effectiveness we could reach was 92.6%.

B. WEIGHTS BY IMEC. TABLEs X and XI show four FILLs where the risk equation was weighted by using weights according to the items' IMEC. The alternatives shown in TABLEs X and XI are based on an overall 88% predicted effectiveness goal. APPENDIX C shows using an effectiveness goal of 88% to be the most cost effective for both Fleets. As seen in TABLEs X and XI, all of the alternatives increase total effectiveness one to six percentage points, while reducing investment costs $.2M to $3.3M, except for Alternative IV in the Pacific which increased costs by $.1M. Effectiveness increased one to nine percentage points for IMEC 3 and four to 11 percentage points for IMEC 4. In the Pacific, Alternative IV provides the best IMEC 4 support at close to current cost. While in the Atlantic, Alternatives II and IV provide the best support for IMEC 4 while maintaining current cost. Using the definition for "best performance" as previously described, Alternative IV is considered to be the "best" between the two Fleets. APPENDIX C also shows similar conclusions using an overall 85% effectiveness goal.

TABLE X

WEIGHTS BY IMEC (PACIFIC)*

(17,245 ITEMS)

ALTERNATIVE	$ VALUE	ACTUAL NET EFFECTIVENESS					
			UNIT	REQN		UNIT	REQN
BENCHMARK (85% GOAL)	68.7M	DLR	69.2%	69.6%	IMEC 1	63.7%	75.3%
		ER	61.1%	62.8%	IMEC 2	78.5%	73.7%
		NER	66.6%	78.6%	IMEC 3	68.9%	67.5%
		TOTAL	65.0%	71.1%	IMEC 4	63.2%	68.0%
ALTERNATIVE I IMEC WT 1 1 2 2 3 3 4 4	66.2M	DLR	65.3%	66.0%	IMEC 1	64.7%	72.3%
		ER	77.7%	73.4%	IMEC 2	80.0%	73.6%
		NER	65.9%	74.7%	IMEC 3	74.4%	71.0%
		TOTAL	69.3%	73.8%	IMEC 4	70.8%	76.6%
ALTERNATIVE II IMEC WT 1 .01 2 .1 3 .5 4 1.0	65.4M	DLR	65.3%	66.0%	IMEC 1	62.0%	66.9%
		ER	77.4%	73.9%	IMEC 2	79.7%	72.4%
		NER	64.7%	71.0%	IMEC 3	74.6%	71.8%
		TOTAL	68.3%	72.2%	IMEC 4	71.1%	77.7%
ALTERNATIVE III IMEC WT 1 1 2 4 3 9 4 16	66.9M	DLR	65.3%	66.0%	IMEC 1	64.7%	72.3%
		ER	78.2%	75.0%	IMEC 2	80.3%	74.7%
		NER	66.0%	75.0%	IMEC 3	74.9%	72.9%
		TOTAL	69.5%	74.8%	IMEC 4	71.1%	78.1%
ALTERNATIVE IV IMEC WT 1 1 2 1 3 99 4 99	68.8M	DLR	67.5%	68.3%	IMEC 1	64.7%	72.3%
		ER	78.6%	76.8%	IMEC 2	79.7%	72.4%
		NER	66.0%	75.2%	IMEC 3	75.4%	76.1%
		TOTAL	69.6%	75.7%	IMEC 4	71.3%	79.4%

*Based on an overall 88% predicted unit effectiveness goal.

TABLE XI

WEIGHTS BY IMEC (ATLANTIC)*

(17205 ITEMS)

ALTERNATIVE	$ VALUE	ACTUAL NET EFFECTIVENESS					
			UNIT	REQN		UNIT	REQN
BENCHMARK (85% GOAL)	60.0M	DLR	65.9%	65.4%	IMEC 1	59.7%	63.3%
		ER	64.1%	65.4%	IMEC 2	81.4%	68.2%
		NER	64.3%	64.7%	IMEC 3	66.0%	65.0%
		TOTAL	64.3%	65.0%	IMEC 4	66.3%	66.6%
ALTERNATIVE I IMEC WT 1 1 2 2 3 3 4 4	59.8M	DLR	62.9%	62.3%	IMEC 1	63.5%	64.8%
		ER	77.8%	69.7%	IMEC 2	87.2%	70.8%
		NER	67.2%	67.2%	IMEC 3	71.9%	67.1%
		TOTAL	70.3%	68.2%	IMEC 4	74.7%	71.9%
ALTERNATIVE II IMEC WT 1 .01 2 .1 3 .5 4 1.0	59.8M	DLR	62.9%	62.3%	IMEC 1	59.0%	63.0%
		ER	78.3%	70.6%	IMEC 2	86.3%	70.0%
		NER	65.0%	66.3%	IMEC 3	72.3%	67.7%
		TOTAL	68.9%	68.1%	IMEC 4	75.5%	73.4%
ALTERNATIVE III IMEC WT 1 1 2 4 3 9 4 16	59.5M	DLR	62.9%	62.3%	IMEC 1	59.0%	63.0%
		ER	75.7%	68.5%	IMEC 2	85.3%	69.3%
		NER	64.5%	65.2%	IMEC 3	70.4%	65.7%
		TOTAL	67.8%	66.6%	IMEC 4	73.6%	70.5%
ALTERNATIVE IV IMEC WT 1 1 2 1 3 99 4 99	59.8M	DLR	62.9%	62.3%	IMEC 1	59.0%	63.0%
		ER	78.4%	70.6%	IMEC 2	82.7%	68.5%
		NER	64.9%	66.4%	IMEC 3	72.8%	68.5%
		TOTAL	68.9%	68.2%	IMEC 4	75.5%	73.3%

*Based on an overall 88% predicted unit effectiveness goal.

C. PROTECTION LEVELS BY IMEC. TABLEs XII and XIII show four FILL alternatives where the minimum protection levels are varied for IMECs 1 and 2 and IMECs 3 and 4. These alternative FILLs are based on a separate predicted unit effectiveness goal for each of the following categories of items: DLR, ER, and NER. TABLES XII and XIII show investment costs increase when the minimum protection level for IMECs 3 and 4 increases to 75% or 85%, while the minimum protection level for IMECs 1 and 2 is held at the current 60%. Therefore, in order to maintain the current spending level, we lowered the minimum protection level for IMECs 1 and 2 from 60% to 2% in Alternatives III and IV. TABLEs XII and XIII also show Alternatives III and IV reduce investment cost $.5M to $2.3M except for Alternative III in the Pacific which increases investment $.2M. All of the alternatives show an increase in total effectiveness of up to five percentage points from the benchmark, except for Alternative IV in the Atlantic. All of the alternatives increase effectiveness for IMECs 3 and 4. The increases range from two to eight percentage points from the benchmark for IMEC 3 and three to ten percentage points for IMEC 4. Using the criteria for "best performance"; i.e., the largest increase in effectiveness for IMECs 3 and 4 while maintaining current spending levels, Alternative III is considered to be the "best" of the alternatives that were tested.

TABLE XII

MINIMUM-MAXIMUM PROTECTION VARIED BY IMEC (PACIFIC)*

(17245 ITEMS)

ALTERNATIVE	$ VALUE	ACTUAL NET EFFECTIVENESS					
			UNIT	REQN		UNIT	REQN
BENCHMARK MIN-MAX PROT. 60% - 98%	68.7M	DLR ER NER TOTAL	69.2% 61.1% 66.6% 65.0%	69.6% 62.8% 78.6% 71.1%	IMEC 1 IMEC 2 IMEC 3 IMEC 4	63.7% 78.5% 68.9% 63.2%	75.3% 73.7% 67.5% 68.0%
ALTERNATIVE I MIN-MAX PROT. IMEC 1 & 2 60% - 98% IMEC 3 & 4 85% - 98%	71.6M	DLR ER NER TOTAL	70.9% 68.7% 66.6% 67.2%	71.4% 69.8% 78.6% 74.3%	IMEC 1 IMEC 2 IMEC 3 IMEC 4	63.7% 78.5% 72.2% 67.5%	75.3% 73.7% 72.6% 74.2%
ALTERNATIVE II MIN-MAX PROT. IMEC 1 & 2 60% - 98% IMEC 3 & 4 75% - 98%	69.6M	DLR ER NER TOTAL	67.5% 65.5% 66.6% 66.2%	68.2% 66.5% 78.6% 72.8%	IMEC 1 IMEC 2 IMEC 3 IMEC 4	63.7% 78.5% 70.7% 65.7%	75.3% 73.7% 70.0% 71.3%
ALTERNATIVE III MIN-MAX PROT. IMEC 1 & 2 2% - 98% IMEC 3 & 4 85% - 98%	68.9M	DLR ER NER TOTAL	69.8% 62.0% 66.6% 65.2%	70.4% 66.2% 78.6% 72.6%	IMEC 1 IMEC 2 IMEC 3 IMEC 4	60.3% 67.1% 72.2% 67.5%	71.9% 64.7% 72.6% 74.2%
ALTERNATIVE IV MIN-MAX PROT. IMEC 1 & 2 2% - 98% IMEC 3 & 4 75% - 98%	67.8M	DLR ER NER TOTAL	70.1% 63.0% 66.6% 65.2%	70.5% 61.8% 78.6% 71.2%	IMEC 1 IMEC 2 IMEC 3 IMEC 4	60.6% 74.5% 71.7% 66.2%	72.0% 65.1% 70.5% 71.3%

*Based on 85% predicted unit effectiveness goals for each of the following categories: DLR, ER, and NER.

TABLE XIII

MINIMUM-MAXIMUM PROTECTION VARIED BY IMEC (ATLANTIC)*

(17,205 ITEMS)

ALTERNATIVE	$ VALUE	ACTUAL NET EFFECTIVENESS					
			UNIT	REQN		UNIT	REQN
BENCHMARK MIN-MAX PROT. 60% - 98%	60.0M	DLR ER NER TOTAL	65.9% 64.1% 64.3% 64.3%	65.4% 65.4% 64.7% 65.0%	IMEC 1 IMEC 2 IMEC 3 IMEC 4	59.7% 81.4% 66.0% 66.3%	63.3% 68.2% 65.0% 66.6%
ALTERNATIVE I MIN-MAX PROT. IMEC 1 & 2 60% - 98% IMEC 3 & 4 85% - 98%	64.5M	DLR ER NER TOTAL	67.6% 73.6% 65.1% 67.6%	67.2% 73.4% 66.9% 69.8%	IMEC 1 IMEC 2 IMEC 3 IMEC 4	59.7% 81.4% 71.0% 72.6%	63.3% 68.2% 72.6% 75.6%
ALTERNATIVE II MIN-MAX PROT. IMEC 1 & 2 60% - 98% IMEC 3 & 4 75% - 98%	62.2M	DLR ER NER TOTAL	65.4% 69.5% 64.7% 66.1%	65.0% 69.8% 66.0% 67.6%	IMEC 1 IMEC 2 IMEC 3 IMEC 4	59.7% 81.4% 68.8% 69.8%	63.3% 68.2% 69.0% 71.5%
ALTERNATIVE III MIN-MAX PROT. IMEC 1 & 2 2% - 98% IMEC 3 & 4 85% - 98%	59.5M	DLR ER NER TOTAL	66.6% 67.6% 68.6% 68.3%	66.2% 69.4% 62.7% 65.8%	IMEC 1 IMEC 2 IMEC 3 IMEC 4	60.9% 71.8% 71.8% 73.9%	53.8% 52.1% 73.4% 76.3%
ALTERNATIVE IV MIN-MAX PROT. IMEC 1 & 2 2% - 98% IMEC 3 & 4 75% - 98%	57.7M	DLR ER NER TOTAL	65.8% 66.5% 68.5% 67.9%	65.3% 65.9% 62.2% 63.9%	IMEC 1 IMEC 2 IMEC 3 IMEC 4	61.5% 78.2% 70.9% 72.7%	59.3% 52.5% 70.6% 72.0%

*Based on 85% predicted unit effectiveness goals for each of the following categories: DLR, ER, and NER.

D. COMBINATION OF ALTERNATIVES. Using the "best" alternatives from the previous tables, combinations of these techniques were used to build alternative FILLs. TABLEs XIV and XV show combinations of those "best" alternatives. The first two alternatives (Alternatives I and II), combine separate effectiveness goals by IMEC and minimum protection levels varied by IMEC to build different FILLs. Alternatives III and IV combine weights by IMEC in the risk equation and minimum protection levels varied by IMEC to construct other loads.

TABLEs XIV and XV show total effectiveness for all alternatives increases about 2-9 percentage points above the benchmark. Effectiveness for IMECs 3 and 4 show significant increases, 1-12 percentage points for IMEC 3 and 8-15 percentage points for IMEC 4. None of the alternatives are significantly better than the others. Alternatives III and IV provide the best IMEC 3 and 4 effectiveness; with IMEC 4 requisition effectiveness increasing 11-15 percentage points (8-12 points for units) and IMEC 3 effectiveness increasing 8-12 percentage points (7-9 points for units). However, Alternatives III and IV decrease IMEC 1 requisition effectiveness significantly. IMEC 1 requisition effectiveness drops 7-9 percentage points in the Pacific and 8-12 percentage points in the Atlantic.

Alternative I produces similar IMEC 4 effectiveness increases as Alternatives III and IV (12 percentage points for requisitions and 8-11 percentage points for units). Although Alternative I produces higher IMEC 3 effectiveness (2-4 percentage points) than the benchmark, the increases are lower than those produced by Alternatives III and IV. Alternative I produces similar IMEC 1 effectiveness in the Pacific as Alternatives III and IV, but has 10-14 percentage points higher IMEC 1 requisition effectiveness in the Atlantic.

In summary, there is no clear cut "best" alternative. In choosing between Alternative I and Alternatives III and IV, we need to balance the smaller IMEC 3 effectiveness increases and the significantly higher IMEC 1 effectivensss provided by Alternative I.

TABLE XIV

COMBINATION OF ALTERNATIVES (PACIFIC)

(17,245 ITEMS)

ALTERNATIVE	$ VALUE	ACTUAL NET EFFECTIVENESS					
			UNIT	REQN		UNIT	REQN
BENCHMARK GOAL MIN PROT 85% 60%	68.7M	DLR ER NER TOTAL	69.2% 61.1% 66.6% 65.0%	69.6% 62.8% 78.6% 71.1%	IMEC 1 IMEC 2 IMEC 3 IMEC 4	63.7% 78.5% 68.9% 63.2%	75.3% 73.7% 67.5% 68.0%
ALTERNATIVE I IMEC GOAL MIN PROT 1 85% 2% 2 90% 2% 3 92% 75% *4 92% 75%	66.9M	DLR ER NER TOTAL	68.4% 77.3% 65.4% 68.8%	68.9% 74.1% 71.7% 72.7%	IMEC 1 IMEC 2 IMEC 3 IMEC 4	64.1% 73.6% 73.2% 71.4%	68.7% 52.9% 69.6% 80.1%
ALTERNATIVE II IMEC GOAL MIN PROT 1 85% 2% 2 90% 2% 3 92% 85% *4 92% 85%	67.9M	DLR ER NER TOTAL	70.9% 76.8% 65.1% 68.5%	71.3% 74.5% 71.5% 72.9%	IMEC 1 IMEC 2 IMEC 3 IMEC 4	64.1% 73.6% 71.5% 71.4%	68.7% 52.9% 70.6% 80.1%
ALTERNATIVE III IMEC WT MIN PROT 1 1 2% 2 1 2% 3 99 75% 4 99 75%	65.2M	DLR ER NER TOTAL	66.7% 78.0% 65.5% 69.1%	67.5% 75.3% 71.6% 73.2%	IMEC 1 IMEC 2 IMEC 3 IMEC 4	63.6% 78.7% 75.4% 71.3%	66.8% 65.8% 75.9% 79.2%
ALTERNATIVE IV IMEC WT MIN PROT 1 1 2% 2 1 2% 3 99 85% 4 99 85%	67.3M	DLR ER NER TOTAL	69.4% 78.3% 65.3% 69.4%	70.5% 75.9% 73.0% 74.3%	IMEC 1 IMEC 2 IMEC 3 IMEC 4	64.1% 79.0% 75.5% 71.3%	68.7% 67.4% 76.7% 79.5%

*The highest predicted effectiveness we could reach was 88.2%.

TABLE XV

COMBINATION OF ALTERNATIVES (ATLANTIC)

(17,205 ITEMS)

ALTERNATIVE	$ VALUE	ACTUAL NET EFFECTIVENESS					
			UNIT	REQN		UNIT	REQN
BENCHMARK GOAL MIN PROT 85% 60%	60.0M	DLR ER NER TOTAL	65.9% 64.1% 64.3% 64.3%	65.4% 65.4% 64.7% 65.0%	IMEC 1 IMEC 2 IMEC 3 IMEC 4	59.7% 81.4% 66.0% 66.3%	63.3% 68.2% 65.0% 66.6%
ALTERNATIVE I IMEC GOAL MIN PROT 1 85% 2% 2 90% 2% 3 92% 75% 4 92% 75%	60.0M	DLR ER NER TOTAL	64.5% 79.5% 69.7% 72.6%	64.0% 72.8% 69.3% 70.7%	IMEC 1 IMEC 2 IMEC 3 IMEC 4	69.0% 82.5% 68.2% 77.1%	66.0% 52.8% 68.9% 78.3%
ALTERNATIVE II IMEC GOAL MIN PROT 1 85% 2% 2 90% 2% 3 92% 85% 4 92% 85%	62.0M	DLR ER NER TOTAL	66.7% 79.6% 69.3% 72.3%	66.2% 73.9% 69.3% 71.3%	IMEC 1 IMEC 2 IMEC 3 IMEC 4	69.0% 82.5% 67.4% 76.7%	66.0% 52.8% 72.4% 78.2%
ALTERNATIVE III IMEC WT MIN PROT 1 1 2% 2 1 2% 3 99 75% 4 99 75%	59.1M	DLR ER NER TOTAL	61.5% 82.0% 68.9% 72.8%	63.9% 76.0% 63.7% 69.2%	IMEC 1 IMEC 2 IMEC 3 IMEC 4	65.1% 85.6% 75.2% 77.9%	55.6% 57.9% 76.1% 81.6%
ALTERNATIVE IV IMEC WT MIN PROT 1 1 2% 2 1 2% 3 99 85% 4 99 85%	60.0M	DLR ER NER TOTAL	63.7% 81.7% 68.0% 72.1%	66.1% 76.2% 60.8% 67.8%	IMEC 1 IMEC 2 IMEC 3 IMEC 4	63.5% 84.5% 75.3% 77.9%	51.8% 55.6% 76.9% 81.7%

IV. SUMMARY AND CONCLUSIONS

Alternative FILLs were built for the Pacific and Atlantic Fleets using various techniques for incorporating IMECs in the depth computations. The areas in which IMECs were tested included separate effectiveness goals by IMEC, weights by IMEC in the risk equation and minimum protection levels varied by IMEC. All of the alternative FILLs were then evaluated in terms of investment and effectiveness and the results compared to a benchmark FILL produced using current Fleet policies and procedures.

The results of the comparison between the benchmark and alternatives showed that cost effective FILLs could be produced by: (1) effectiveness goals of 85%, 90%, 92%, and 92% for IMECs 1, 2, 3, and 4, respectively, or (2) weights of 1, 1, 99, and 99 for IMECs 1, 2, 3, and 4, respectively, in the risk equation, or (3) minimum-maximum protection levels 2% - 98% for IMECs 1 and 2 and 75% or 85% - 98% for IMECs 3 and 4.

Test load lists were constructed using combinations of those cost-effective alternatives. TABLEs XVI and XVII show a summary of the costs and net requisition effectiveness for each combination of alternatives. Alternative II is more costly than the benchmark for the Atlantic Fleet. Alternatives I, III and IV provide similar IMEC 4 effectiveness while maintaining current spending levels. Alternative I produces higher IMEC 3 effectiveness than the benchmark, but the increases are smaller than those produced by Alternatives III and IV. However, Alternative I produces significantly higher IMEC 1 effectiveness in the Atlantic than Alternatives III and IV. (IMEC 1 includes most NER items.) Thus, there is really no clear cut "best" alternative.

TABLE XVI

SUMMARY OF COMBINATION ALTERNATIVES (PACIFIC)

ALTERNATIVE	ACTUAL NET REQUISITION EFFECTIVENESS				
	$ VALUE	IMEC 1	IMEC 2	IMEC 3	IMEC 4
BENCHMARK	68.7M	75.3%	73.7%	67.5%	68.0%
I (IMEC goals, 2-75% Min)	66.9M	68.7%	52.9%	69.6%	80.1%
II (IMEC goals, 2-85% Min)	67.9M	68.7%	52.9%	70.6%	80.1%
III (IMEC weights, 2-75% Min)	65.2M	66.8%	65.8%	75.9%	79.2%
IV (IMEC weights, 2-85% Min)	67.3M	68.7%	67.4%	76.7%	79.5%

TABLE XVII

SUMMARY OF COMBINATION ALTERNATIVES (ATLANTIC)

ALTERNATIVE	ACTUAL NET REQUISITION EFFECTIVENESS				
	$ VALUE	IMEC 1	IMEC 2	IMEC 3	IMEC 4
BENCHMARK	60.0M	63.3%	68.2%	65.0%	66.6%
I (IMEC goals, 2-75% Min)	60.0M	66.0%	52.8%	68.9%	78.3%
II (IMEC goals, 2-85% Min)	62.0M	66.3%	52.8%	72.4%	78.2%
III (IMEC weights, 2-75% Min)	59.1M	55.6%	57.9%	76.1%	81.6%
IV (IMEC weights, 2-85% Min)	60.0M	51.8%	55.6%	76.9%	81.7%

As previously mentioned, using weights in the risk equation has disadvantages; i.e., assigning weights to the different IMECs is purely subjective and is difficult for the users to improve the performance of one IMEC if only one group is performing poorly. The user can more easily improve the performance of a given IMEC without affecting other IMECs using effectiveness goal by IMEC. Therefore, Alternative I, predicted unit effectiveness goals of 85%, 90%, 92%, and 92% for IMECs 1, 2, 3, and 4, respectively, and minimum - maximum protection levels of 2% - 98% for IMECs 1 and 2 and 75% - 98% for IMECs 3 and 4, is considered to be the

"best" for both Fleets. The same conclusion is reached when considering unit effectiveness vice requisition effectiveness. Although effectiveness goals by IMEC may increase the number of parameters used to achieve the desired effectiveness goal, the parameters could be held to the current number by combining IMECs 1 and 2 and combining IMECs 3 and 4.

V. RECOMMENDATION

We recommend using separate effectiveness goals by IMEC and applying higher minimum protection levels for IMECs 3 and 4 and lower minimum protection levels for IMECs 1 and 2 in FILL depth computations.

APPENDIX A: REFERENCES

1. FMSO ltr 5250 9321/MEO-E54/253 of 9 Sep 1986

2. Operations Analysis Report 167

APPENDIX B: EFFECTIVENESS GOALS BY IMEC

The graphs displayed in FIGURES 1 and 2 show for each Fleet, Pacific and Atlantic, the dollar value of different Fleet Issue Load Lists (FILLs) versus the unit effectiveness associated with that cost for each Item Mission Essentiality Code (IMEC). The graphs show the point on the curve where the highest effectiveness is obtained for the least amount of dollars or commonly known as the most cost effective goal. Graphically, it is the point at which the curve begins to reach a plateau or "level off". For example, in the Pacific the cost effective goals are 86%, 97%, 93% and 88% for IMECs 1, 2, 3 and 4, respectively. Comparing the cost effective goals by IMEC in the Pacific with the goals in the Atlantic, overall cost effective goals were obtained, 85% for IMEC 1, 95% for IMEC 2, 92% for IMEC 3 and 90% for IMEC 4.

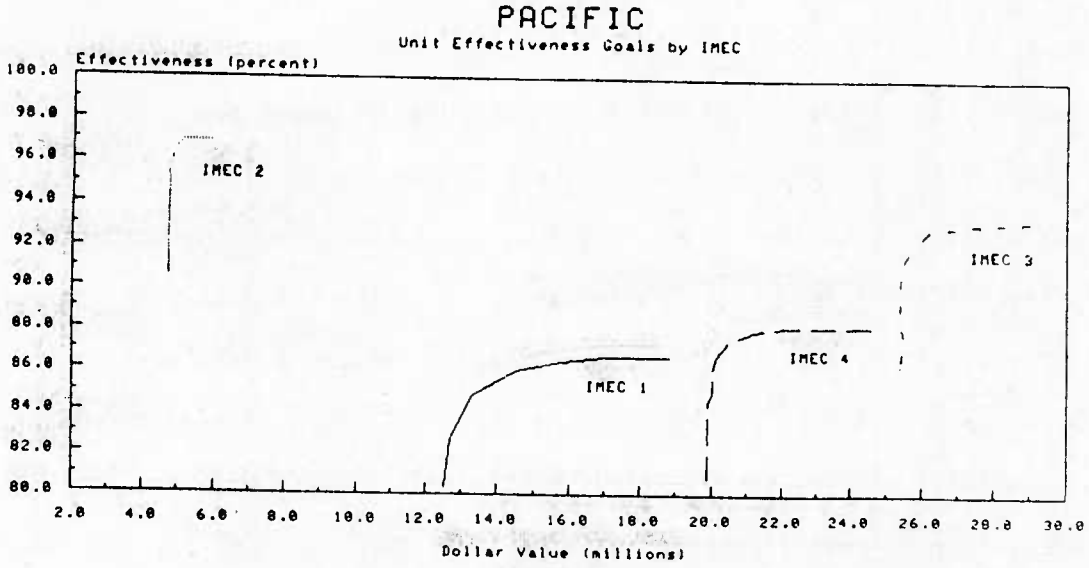

FIGURE 1

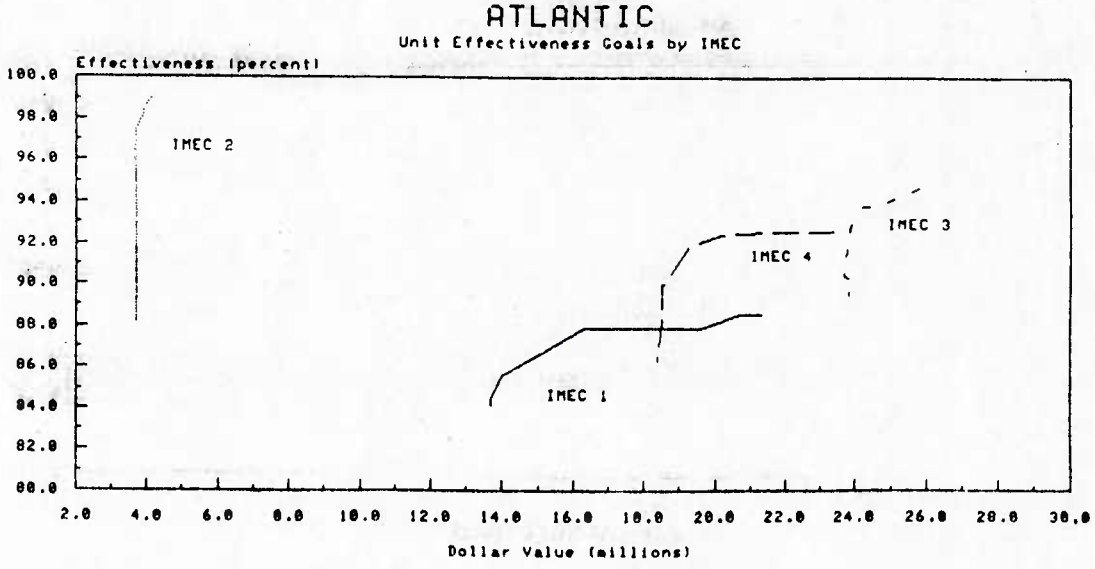

FIGURE 2

APPENDIX C: WEIGHTS BY IMEC

The graphs in FIGURES 1 and 2 show the relationship of dollar value of different Fleet Issue Load Lists (FILLs) using weights by Item Mission Essentiality Code (IMEC) to the effectiveness goal that is associated with that cost. The graphs show the point on the curve where the highest effectiveness is obtained for the least amount of dollars or commonly referred to as the most cost effective goal. Graphically, it is the point at which the curve begins to reach a plateau or "level off". For example, in the Pacific, the alternatives which use weights by IMEC in the risk equation show the cost effective goals range from 88% to 89%. While in the Atlantic, the cost effective goals range from 91% to 92%. Comparing the cost effective goals in the Pacific with the goals in the Atlantic, an overall cost effective goal of 88% was obtained.

TABLEs C-1 and C-2 show dollar values and effectiveness results for alternatives that applied different weights by IMEC in the risk equation. Effectiveness shown in the tables measured how well the load list compared with 90 days of actual demand. All of the alternatives in the tables were based on an overall 85% predicted effectiveness goal.

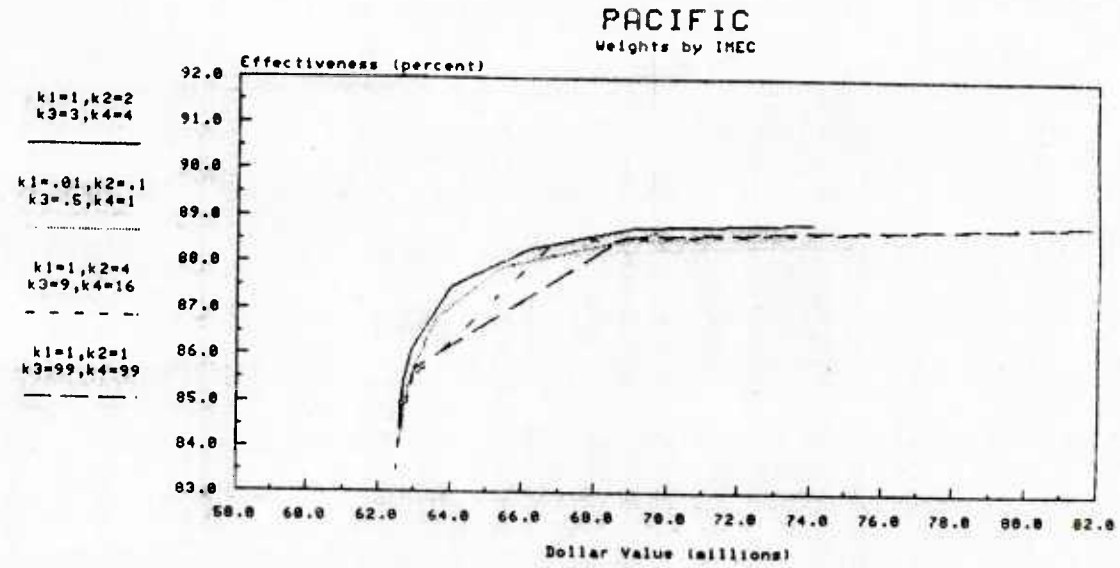

FIGURE 1

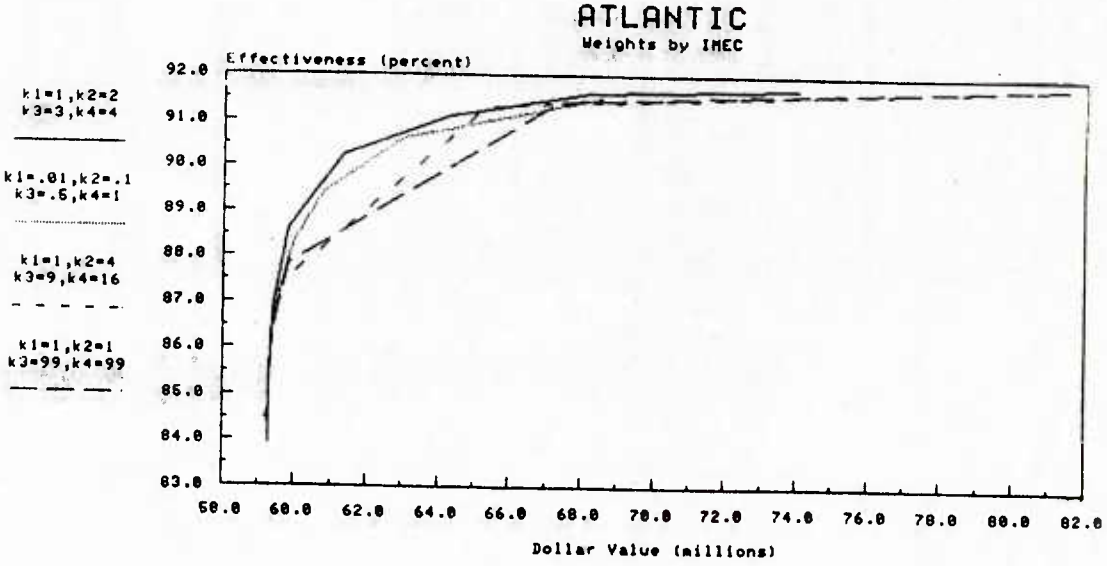

FIGURE 2

TABLE C-1

WEIGHTS BY IMEC (PACIFIC)*

(17,245 ITEMS)

ALTERNATIVE	$ VALUE	ACTUAL NET EFFECTIVENESS					
			UNIT	REQN		UNIT	REQN
BENCHMARK	68.7M	DLR	69.2%	69.6%	IMEC 1	63.7%	75.3%
		ER	61.1%	62.8%	IMEC 2	78.5%	73.7%
		NER	66.6%	78.6%	IMEC 3	68.9%	67.5%
		TOTAL	65.0%	71.1%	IMEC 4	63.2%	68.0%
IMEC WT							
1 1	62.6M	DLR	65.3%	66.0%	IMEC 1	54.7%	62.1%
2 2		ER	69.8%	65.0%	IMEC 2	74.7%	65.7%
3 3		NER	59.4%	63.9%	IMEC 3	69.7%	63.6%
4 4		TOTAL	62.4%	64.5%	IMEC 4	66.1%	67.1%
IMEC WT							
1 .01	62.7M	DLR	65.3%	66.0%	IMEC 1	52.9%	61.7%
2 .1		ER	69.8%	65.0%	IMEC 2	74.7%	65.7%
3 .5		NER	59.4%	63.9%	IMEC 3	69.7%	63.6%
4 1.0		TOTAL	62.6%	65.4%	IMEC 4	68.1%	69.4%
IMEC WT							
1 1	62.7M	DLR	65.3%	66.0%	IMEC 1	54.0%	61.9%
2 4		ER	70.9%	65.8%	IMEC 2	75.0%	65.8%
3 9		NER	59.4%	64.1%	IMEC 3	70.5%	64.1%
4 16		TOTAL	62.7%	65.0%	IMEC 4	67.3%	68.3%
IMEC WT							
1 1	62.8M	DLR	65.3%	66.0%	IMEC 1	53.0%	61.8%
2 1		ER	71.7%	66.7%	IMEC 2	72.3%	64.7%
3 99		NER	59.1%	64.7%	IMEC 3	71.9%	65.8%
4 99		TOTAL	62.7%	65.6%	IMEC 4	68.2%	69.6%

*Based on an overall 85% predicted effectiveness goal.

TABLE C-2

WEIGHTS BY IMEC (ATLANTIC)*

(17,205 ITEMS)

ALTERNATIVE	$ VALUE	ACTUAL NET EFFECTIVENESS					
			UNIT	REQN		UNIT	REQN
BENCHMARK	60.0M	DLR	65.9%	65.4%	IMEC 1	59.7%	63.3%
		ER	64.1%	65.4%	IMEC 2	81.4%	68.2%
		NER	64.3%	64.7%	IMEC 3	66.0%	65.0%
		TOTAL	64.3%	65.0%	IMEC 4	66.3%	66.6%
IMEC WT							
1 1	59.3M	DLR	62.9%	62.3%	IMEC 1	56.3%	62.8%
2 2		ER	68.1%	65.7%	IMEC 2	74.3%	67.5%
3 3		NER	60.2%	63.9%	IMEC 3	64.9%	64.2%
4 4		TOTAL	62.5%	64.6%	IMEC 4	66.4%	66.5%
IMEC WT							
1 .01	59.3M	DLR	62.9%	62.4%	IMEC 1	55.9%	62.7%
2 .1		ER	69.0%	66.0%	IMEC 2	70.7%	67.4%
3 .5		NER	60.5%	64.0%	IMEC 3	65.7%	64.3%
4 1.0		TOTAL	63.0%	64.8%	IMEC 4	68.1%	67.0%
IMEC WT							
1 1	59.3M	DLR	62.9%	62.3%	IMEC 1	56.1%	62.7%
2 4		ER	68.6%	65.8%	IMEC 2	71.5%	67.4%
3 9		NER	60.5%	64.0%	IMEC 3	65.3%	64.2%
4 16		TOTAL	62.9%	64.8%	IMEC 4	67.6%	66.8%
IMEC WT							
1 1	59.3M	DLR	62.9%	62.3%	IMEC 1	55.9%	62.7%
2 1		ER	70.1%	66.2%	IMEC 2	70.7%	67.4%
3 99		NER	60.9%	64.1%	IMEC 3	67.6%	64.6%
4 99		TOTAL	63.6%	65.0%	IMEC 4	68.9%	67.3%

*Based on an overall 85% predicted effectiveness goal.

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FPO San Francisco 96651 (Subic)

Chief of Naval Operations
Navy Department (OP-914)
Washington, DC 20350

Chief of Naval Operations
Navy Department (OP 412)
Washington, DC 20350

Commander Submarine Force
U. S. Atlantic Fleet
Attn: N5
Norfolk, VA 23511

Commander Submarine Force
U. S. Pacific Fleet
Attn: Code 41
Pearl Harbor, HI 96860

Commander
Naval Surface Forces
Naval Amphibious Base, Coronado
San Diego, CA 92155

Commander
Naval Air Force
U. S. Atlantic Fleet
Attn: Code 42
Norfolk, VA 23511

Commander
Naval Air Force
U. S. Pacific Fleet
Attn: Code 44
Naval Air Station, North Island
San Diego, CA 92135

Commander
Naval Logistics Command
U. S. Pacific Fleet (Code 4121)
Pearl Harbor, HI 96860

Center for Naval Analyses
2000 N. Beauregard Street
Alexandria, VA 22311

Naval Postgraduate School
Attn: Alan McMasters (Code 54MG)
Monterey, CA 93940 (3 cys)

Naval Postgraduate School
Attn: Thomas Moore (Code 54MR)
Monterey, CA 93940

Superintendent (Code 1424)
Naval Postgraduate School
Monterey, CA 93940

Naval Postgraduate School
Attn: Code 55 (MI)
Monterey, CA 93940

Commanding Officer
Naval Supply Corps School
Attn: Code 43
Athens, GA 30605

U. S. Army Logistics Management Center
Defense Logistics Studies Information Exchange
Fort Lee, VA 23801

Defense Documentation Center
Cameron Station
Alexandria, VA 22314 (2 cys)

Defense Technical Information Center
Cameron Station
Alexandria, VA 22314